

REMARKABLE BEES FROM A RAIN FOREST.

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(Text figures 1-3.)

INTRODUCTION.

The Illawarra range, five miles or so inland, runs more or less parallel to the South Coast of New South Wales, and the elevation of the "tops" is approximately 2,100 feet above sea-level. Clouds rolling in on the south-eastern winds from the warm Pacific condense on the eastern slopes of the range, and shed an annual precipitation of 79 inches (in 1949 over 90 inches were recorded), consequently, the climate is a humid one.

Shelter from the dry westerly winds favoured the development of a unique rain-forest at no great elevation, and the mesophytic flora is varied and spectacular, with genera such as *Tristania*, *Backhousia*, *Doryphora*, *Eugenia*, *Ceratopetalum*, *Brachychiton*, *Ficus*, *Prostanthera*, with *Cedrela* only by rare specimens.

Leptospermum and *Persoonia* are in "pockets" on the partially-cleared terraces "or ledges," which may be a quarter-mile wide, but provide good pasture for the milch cows of the dairy farmers. The district has been settled for over a hundred years, and the introduced blackberry is now a ubiquitous and noxious weed.

The soil is of red volcanic loam, but the rocks in the gorges are mostly basalt; rim-cliffs at the 2,000 ft. level are sandstone slightly metamorphosed; the coastal plain is of volcanic loam with outcrops of basalt, which is quarried for road construction.

It was postulated by Norman W. Rodd, an analytical chemist of Sydney, and who has made many contributions to our knowledge of the Australian Hymenoptera, that such an area should have an insect fauna equally as remarkable as the flora.

His subsequent excursions into the rain-forest in 1949-50 have amply demonstrated how soundly he had reasoned, for his collections contain a number of new and spectacular forms. Only the Apoidea are dealt with in this paper, but the wasps (*Sericophorus*) are not less surprising, and a paper on these is in the press.

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Division: COLLETIFORMES.

Family: COLLETIDAE.

Paracolletes alleynae Raym.

A male very close to *P. alleynae*, but may be separated by the distinct punctures of the clypeus; absence of transverse lineation on the metathorax; black polished tegulae; long, narrow abdomen; lighter red of the legs. The bee is close to *P. providellus bacchalis* Ckll., but that has reddish-amber margins on the abdominal terga. When the female is known it will probably be separated.

Jamberoo, N.S.W., January, 1950, Norman W. Rodd.

Taken on flowers of *Leptospermum flavescens* var. *grandiflorum*.

Paracolletes chalybeatus Er.

A female is referred to this doubtful species. It is similar to specimens from Mt. Victoria, New South Wales (leg. Keith McKeown, Jan., 1941), but the nerves of the wings are black, not brown.

Locality: Jamberoo, New South Wales. Jan., 1950, Norman W. Rodd.

Paracolletes crassipes leptospermi Ckll.

A series of females were observed digging and entering shafts in the middle of a busy colony of *Cladocerapis persooniae* Raym. The collector suggested that the association of the two bees should be investigated.

Jamberoo, N.S.W., Jan., 1950. Norman W. Rodd.

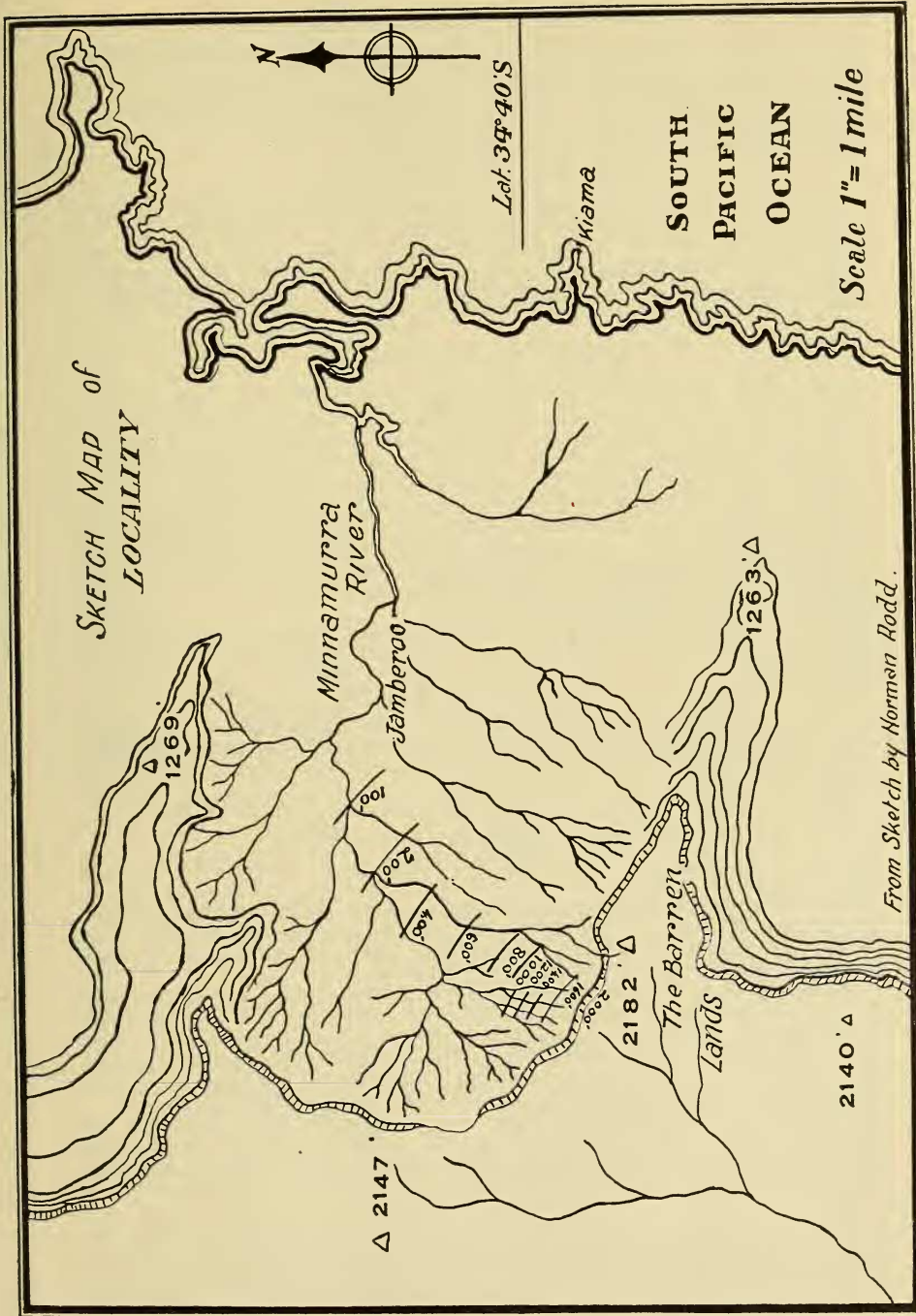


Fig. 1: Sketch Map of the locality in New South Wales.

Paracolletes subviridis illawarraensis sub-sp. nov.

Two females which are exceedingly close to the species, but lack the metallic lustre on the head and the thorax; abdomen obscurely green, but not dull, very smooth and shining; second recurrent meets the third intercubitus nervure. This may be only a mainland form. The species was described from Bridport, Tasmania.

Jamberoo, N.S.W., Jan., 1950 Norman W. Rodd,

Taken on flowers of *Leptospermum flavescens* var. *grandiflorum*.

Cladocerapis persooniae Raym.

A large series of males and females. The bees had excavated a number of shafts, forming an extensive colony on one of the "ledges" at the 1,600 ft. level. The bees in this genus are endemic to the botanical genus *Persoonia*, and the females were observed visiting the flowers of *P. mollis*. The collector detected the characteristic odour of these plants in the stores of the bees. (A brief account of the remarkable colony is given here.)

NOTES ON THE BIOLOGY.

The collector excavated an extensive colony in the red volcanic ground at the 1,600 ft. level. The shafts went down sometimes to a depth of 35 cm., but the majority terminated at about 25 cm. The pear-shaped colloidal skin cells measured 15 mm. at the long axis, and 7 mm. at the short, and the moist pollen-pudding of batter is spherical, with the characteristic aromatic odour of the flowers. The larvae present no marked departures from the typical form of bees, for there are no nodes or spines such as are found in halictine and nomiine larvae. Those reared in the artificial conditions of the author's laboratory required twelve months for their full development, consequently there would be only one brood for the season. The cells are separated from the main shaft by earthen plugs, so that the architecture differs from that of *C. colmani* Raym.

Hordes of parasitic wasps, one very close to *Labium rificutum* Curran, and the other a large red evanid, ranged tirelessly to and fro over the shafts. (See *Paracolletes crassipes*.)

Callomelitta picta Sm.

A female typical in all characters, with the red scutellum (black in *C. perpicta* Ckll). Taken from cells built in punky wood, a habit observed at Emerald, Ringwood, and Mt. Bogong, Victoria. The bees, it would seem, prefer localities with a heavy rainfall.

Locality: Jamberoo, New South Wales, Jan., 1950, Norman W. Rodd.

Binghamiella (Pachyodonta) sub-gen. nov.

The author proposes a new sub-genus for a remarkable red and black female, 8 mm. approximately in length.

Sphecodes antipodes was described by Smith in 1853, but the species was separated as *Binghamiella* by Cockerell in 1907. No other species was added, but in 1916 Cockerell proposed the sub-species *insularis*, from Tasmania, and Rayment in 1939 described a variety, *nigra*, from Cann River, Victoria.

In January, 1950, Norman W. Rodd collected a series of red and black females which differ from *Binghamiella* by the following characters: The large spoon-like mandibulae are excessively short and broad; there is a large maxillary inner comb; the pygidial plate long and narrow; lateral margins of the long patella nodulose; segments 3·4·5·6 of the abdomen have a hairy vestiture; the gradulus of the third (morphological) sternum is different, and there is a peculiar lateral carina.

In other characters the female agrees with *Binghamiella*; the rugose head and thorax; the short, broad emarginate glossa; the strigilis of the anterior tibia; the finely serrated calcariae of the posterior leg; the long patella, and the dark wings; the polished basal segment of the abdomen. Unfortunately, only the female is known.

The fuliginous wings of a number of bees show a "shadow" neuration of white lines, and these are regarded by many authors as vestiges of a neuration that has become obsolete. Since they are present in Families with little relation they have probably descended from some ancestral PROTOHYMENOPTERON. The pattern is more extensive in *Pachyodonta*.

Such lines are conspicuous on the European species *Andrena flossae* Pz., and the unique Australian bee *Melitidia manskii* Raym. They are present also on *Halictus peraustralis* Ckll., but these bees are in the Division ANDRENIFORMES. They may be observed in the more primitive COLLETIFORMES; other Australian genera with such pale lines are *Hylaeoides*, *Hylaeus*, *Crocisa*, and even *Megachile*.

Bees with clear wings often have "breaks" in the neuration which aline with the shadow neuration, so that it would appear that they, too, retain the vestiges, although they are not evident to the eye. The author has not attempted to work out the homologies of the pale lines or alar fenestrae.

Binghamiella (Pachyodonta) fulvicornis sub-gen. et sp. nov.

(Fig. 2.)

Genotype, Female—Length, 8.5 mm. approx. Black and red.

Head shining, excessively rugose, a few golden hairs over the face; two deep, short foveae laterally; frons with the coarse rugae in longitudinal lines; clypeus large, polished, convex, coarsely punctured, a few golden hairs; supraclypeal area highly convex, with a polished area; vertex finely adapted to the mesothorax; compound eyes with the anterior margins almost parallel; genae coarsely rugoso-

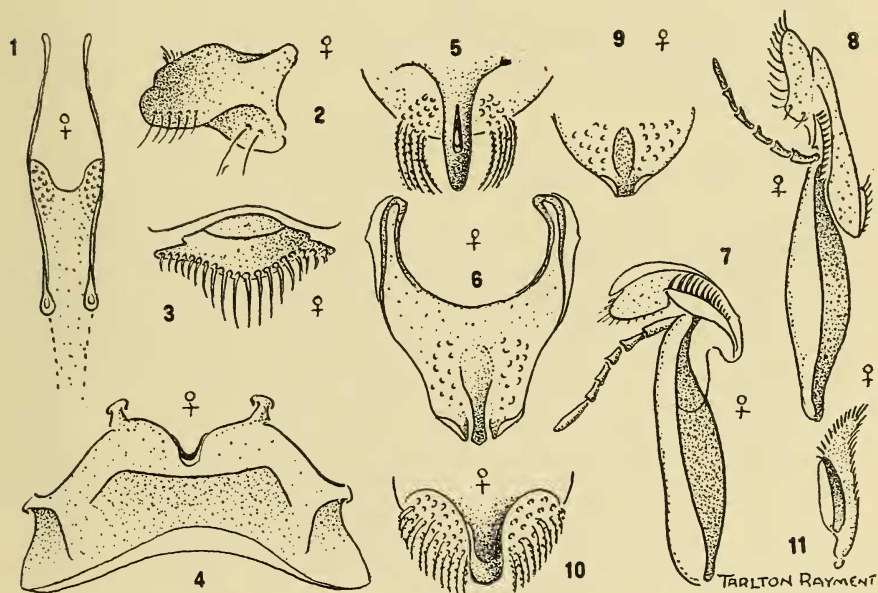


Fig. 2: Details of *Binghamiella (Pachyodonta) fulvicornis* Raym.

1. Pharyngeal plate of female *B. (P.) fulvicornis*, sp. nov.
2. The broad, short mandible is very different from the tridentate one of *Binghamiella antipodes* (Sm.).
3. Labrum and fringe.
4. Third (morphological) sternum of the abdomen has a peculiar lateral carina.
5. Pygidial plate of the female.
6. Apical sternum of the abdomen.
7. Maxilla with palpus and inner comb.
8. Maxilla with palpus and inner comb of *Binghamiella antipodes* (Sm.).
9. Apical sternum of abdomen of *Binghamiella* female.
10. Pygidial plate of *Binghamiella*.
11. Strigilis of *B. (P.) fulvicornis*.

punctate, a few long golden hairs; labrum amber, a long narrow suboval with a fringe of golden setae; mandibulae short and broad, amber, spoon-like; antennae fulvous, the scape slender and darker.

Prothorax not visible from above; pleura coarsely rugoso-punctate; tubercles dark-red, with a fringe of white hair; mesothorax with the disc red, but a black triangle posteriorly, excessively coarsely punctured and rugose, a median depression, the parapsidal furrows conspicuous; scutellum with a similar coarse sculpture, black; postscutellum with finer sculpture, black; metathorax black, shining, with a complicated rugosity difficult to describe, tufts of pale hair laterally; abdominal dorsal segment 1 black, highly polished, few large punctures, 2 red, closely punctured, hind margin black; other segments blackish with amber margins, much more closely punctured, much appressed golden hair; ventral segments black, with a scopa of long white hair, caudal fimbria reddish-gold.

Legs red, coxae, trochanters, and femora basally black, with white hair; tarsi reddish, slender; claws red, bifid; hind calcar reddish, finely serrated; tegulae reddish-amber; wings deep fuliginous, with a rich purple lustre; nervures brownish, strong, the two recurrents entering the two cubitals at about the same distance from the ends (see discussion); pterostigma brownish-black; hamuli seven, weak.

Locality: Jamberoo, New South Wales, January, 1950, Norman W. Rodd.

Genotype in the collection of the author.

Allies: Not very near to *B. antipodes* (Sm.), and may be raised to full generic rank when the male is known. It is a very distinctive bee, and there is a probability that *Callomelitta turnerorum* Ckll. will be referred to *Pachyodonta*.

Taken on flowers of *Prostanthera lasianthos*.

Family HYLAEIDAE.

Stilpnosoma clypeata, sp. nov.

Type, Female—Length 10 mm. approx. Black, with an obscure silky lustre.

Head large, quadrate, wider than the thorax, shining, and adapted to the curve of the mesothorax, the whole with a microscopic tessellation; frons with a fine carina reaching the median ocellus; clypeus short but wide, with a median depression, and two large nodes laterally, and a small median tooth; supra-clypeal area large and convex; vertex depressed laterally, ocelli elevated, with a minute sulcus between; compound eyes reniform; genae large, microscopically lineate, a few shallow punctures; labrum black, polished; mandibulae short, broad, tridentate, subtriangular, a few golden hairs; antennae black, flagellum obscurely brownish beneath.

Prothorax covered with a dense fleece of mossy golden hair which is partly masked when the head is against the mesothorax; tubercles masked with similar golden hair also a small area posteriorly; mesothorax coriaceous, a minute tessellation that is almost granular, a few inconspicuous shallow punctures; scutellum similar, with a median depression; postscutellum rougher and duller; metathorax with an area covered by a scale-like sculpture, a few white hairs laterally; abdominal dorsal segments sericeous, finely transversely lineolate, some blackish hair apically, and a minute narrow pygidial plate; ventral segments similar, with a few scattered punctures.

Legs black, almost nude, very few white hairs, the posterior tibiae with a number of spiculae; tarsi black, hair yellowish, curved in a peculiar manner on anterior legs for collecting pollen; claws bifid red; hind calcar finely serrated, amber-colour; tegulae black; wings somewhat dusky; nervures black, strong; second cubital cell half the length of the first, receives the recurrents at equal distances; pterostigma large and black; hamuli about seven, weak.

Locality: Jamberoo, N.S.W. 20th January, 1949. Norman W. Rodd.

Type in the collection of the author.

Allies: It should, perhaps, be given the genotype of a new genus, for it is not a typical *Stilpnosoma*. The remarkable structures of the clypeus and the mandibles resemble those of certain *Megachiles*, but the general fascies approaches that of *Euryglossimorpha*. Had a male been available for study I should have proposed a new generic diagnosis.

Meroglossa basilauta, sp. nov.

Type, Female—Length, 12 mm. approx. Black, yellow marks.

Head long, shining, coarsely punctured; lateral face-marks primrose-yellow, shaped like a Mexican hat; frons more closely punctured; clypeus somewhat aciculate, a few coarse punctures, and a large hexagonal yellow mark at apex reaching the lateral ones; supraclypeal area high, with a sulcus and a quadrate yellow mark; vertex with two long facial foveae that curve in to meet the lateral ocelli, where they open out into a large smooth area; compound eyes reniform; genae prominent, microscopically lineate, a few large punctures; labrum black, with a large tubercle; mandibulae black, hardly bidentate, numerous yellow hairs; antennae black, flagellum obscurely reddish beneath.

Prothorax black, thickened; tubercles primrose-yellow, but no yellow mark on pleura; mesothorax closely punctured, a few short black hairs, a minute sculpture; scutellum with a broad yellow band; postscutellum black, granular; metathorax black, granular, a few indistinct longitudinal rugae; abdominal dorsal segment one polished black, scattered small punctures, in contrast to the duller black of the others, which have larger closer punctures; ventral segments shining, coarsely punctured.

Legs black, slender, white hair; tarsi similar; claws bifid, blackish-red; hind calcar finely serrated, amber; tegulae black, finely tessellate; wings somewhat fuliginous; nervures black, strong, first recurrent meeting the first intercubitus; long second cubital receiving the second recurrent at its apical third; pterostigma long and black; hamuli nine, not strong.

Locality: Jamberoo, N.S.W. 10th January, 1950. Norman W. Rodd.

Bees taken on flowers of *Loranthus* species.

Type in the collection of the author

Allies: *M. nigrifrons* (Sm.), which has yellow tubercles and a yellowish crescent on pleura; *M. diversipuncta* Ckll., which has black tubercles and a yellow crescent.

The yellow marks of the "face" of the new species are conjoined to form a conspicuous diamond pattern.

Two acarine mites, hypopus stage of *Anoetus* species, were taken from the thorax.

Analastoroides foveata Raym.

A series of remarkable black females closely resembling *Hylaeoides concinna* Fabr., with a wide abdominal band of reddish-orange colour, due to hair, and not to integument. The bees in this genus lack the tibial hooks of *Hylaeoides*, and both bees closely resemble alastorid wasps.

Locality: Jamberoo, N.S.W. January, 1949-50. Norman W. Rodd.

Meroglossa nigrifrons (Sm.).

(*Prosopis nigrifrons* Sm., Cat. Hym. B.M., i, p. 30, 1853.)

A series of males, and females larger than type, but otherwise typical.

Jamberoo, N.S.W. 20th January, 1950. Norman W. Rodd.

Both sexes on flowers of *Loranthus* sp.

Males (allotype) and females, typical.

Cheltenham, N.S.W., 16th April, 1950. Norman W. Rodd.

Both sexes sheltering in a gallery bored in an *Acacia* tree. The small chamber, 45 mm. long, with a diameter of 5 mm., was lined out with white silk, probably not woven by the bees.

Males, Typical.

Cowan, N.S.W. 30th August, 1947. Norman W. Rodd.

Allotype. Male—Length, 9 mm. approx. Black, with yellow markings.

Head shining, very long, laterally a deep sulcus along anterior orbital margins; face-marks yellow, paler and leaf-like in the polished sulcus, but above the insertion of the antennae they terminate in a yellow dome, frons black, clypeus narrow, the yellow truncate at apex; the deep lateral grooves force the clypeus and the supraclypeal area up into a high narrow ridge; a small pale dot just under the scapes; vertex coarsely punctured; the deep narrow facial foveae curving to the lateral ocelli; compound eyes large, converging below; genae black, with black hair; a short fine yellow line along posterior orbital margin; labrum black, with a short median yellow bar; mandibulae black; antennae with expanded black scapes, flagellum black, obscurely red beneath.

Prothorax black, with many white hairs in a line, swollen laterally; tubercles butter-yellow, a much larger yellow mark posteriorly; mesothorax with a microscopic tessellation and many coarse large punctures; scutellum and postscutellum with large yellow areas; metathorax with an elevated area covered with coarse longitudinal rugae, sides of elevation with scale-like sculpture, but coarse punctures beyond; abdominal dorsal segments shining, with well-spaced coarse punctures, closer and finer on basal; ventral segments black, coarsely punctured, a few stiff long bristles apically; the basal sternite very small and partially divided.

Legs black, a few white hairs, chiefly on the femora, anterior tibiae with reddish on front; tarsi blackish-brown, with some smoky hair; claws bifid, dark-red; hind calcar black, finely serrated; tegulae black, anteriorly closely punctured; wings slightly dusky; long hairs; nervures blackish-brown; the large second cubital cell receiving both recurrents well inside the intercubiti; pterostigma large, blackish-brown; hamuli about eight.

Locality: Cheltenham, N.S.W. 16th April, 1950. Norman W. Rodd.

Cowan, N.S.W. 30th August, 1947. Norman W. Rodd.

Allotype in the collection of the author

Allies: By the deep caniculation of the "face" it approaches *M. eucalypti*, which has similar rugae on the metathorax, but much red on the mesothorax; *M. sculptissima* has the caniculation of the face, but scapes are ivory. (I had already written the specific description for a new species when the true association of the sexes was proved by the collector.)

Meroglossa xanthocollaris sp. nov.

Type, Female—Length, 7 mm. approx. Black with yellow marks on thorax.

Head long, black, tessellate sculpture; face with scattered shallow punctures; frons nude; clypeus black, sculptured like the frons; supraclypeal area somewhat aciculate; vertex with short facial foveae; compound eyes reniform; genae with a short malar area, a few shallow punctures; labrum black, with a tubercle; mandibulae black, bidentate; antennae black, flagellum ferruginous beneath.

Prothorax primrose-yellow, swollen laterally; tubercles yellow; mesothorax black, with a dull tessellate sculpture and a few shallow punctures; scutellum and postscutellum similar, without any yellow mark; metathorax short, with a scale-like sculpture; abdominal dorsal segments black, with a silky lustre, and an excessively fine transverse lineation, a few black hairs apically; ventral segments similar.

Legs slender, black, except the anterior femora and tibiae basally which are primrose-yellow, a few white hairs; tarsi black; claws reddish; hind calcar black; tegulae black; wings slightly fuliginous; nervures blackish; the large second cubital cell receiving both recurrents; pterostigma brownish-black.

Locality: Jamberoo, N.S.W. 20th January, 1950. Norman W. Rodd

Type in the collection of the author

Allies: Approaches *M. kelvini* Ckll. (8.5 mm.), which is smaller, and easily separated by the entirely black legs and coarse puncturing of the frons. The mouth-parts cannot be examined, but it is almost certainly *Meroglossa*.

Taken on flowers of *Leptospermum flavescens* var. *grandiflorum*.

Family: HALICTIDAE.

Parasphcodes altichus Sm.

A male that conforms to Smith's description, except that the dark-red of the first tergum is almost obscured by a large black triangular mark; the second tergum has a still larger black area, so that the red is reduced to a mere lateral spot. The truncation of the metathorax has the carina of the type. Described from van Dieman's Land (Tasmania), but the altitude of Jamberoo probably offsets the difference in latitude.

Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.

On flowers of *Leptospermum flavescens* var. *grandiflorum*.

Two large golden mites, nymphs of a new genus and species of LAELAPTIDAE, were attached to the thorax. These will be described by Mr. H. Womersley, Adelaide.

Parasphcodes atronitens Ckll.

Four females, typical except for a tuft of creamy-coloured hair on the post-scutellum (not mentioned in the original description). This species is entirely black.
 Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.
 Taken on flowers of *Prostanthera lasianthos*

Parasphcodes fultoni Ckll.

Two females, typical in all characters.
 Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.
 Taken on flowers of *Leptospermum flavescens* var. *grandiflorum*.

Parasphcodes submeracus Ckll.

Three females, not quite typical, with considerable black colour on the third tergum.
 Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.
 Described from Stanthorpe, Queensland.
 On flowers *Leptospermum flavescens* var. *grandiflorum*.

Parasphcodes tilachiformis Ckll.

Three males.
 Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.
 On flowers *Leptospermum flavescens* var. *grandiflorum*.

Parasphcodes percallomelittinus, sp nov.

Type, Male—Length, 9 mm. approx. Black and red.

Head black, almost circular from the front; face with much long white hair; frons excessively closely punctured; clypeus produced, with a large oval yellow mark with a pointed extension above; supraclypeal area black, coarsely punctured; vertex with scanty white hair; compound eyes reniform, converging below; genae lineate, with a few long white hairs; labrum black; mandibulae black; antennae very long, black.

Prothorax laterally produced to a large triangular node; tubercles black, with a copious white fringe; mesothorax black, with a median broad band of dull-red, excessively closely punctured, dull, a few white hairs (on some specimens the band is very short); scutellum red, closely punctured; postscutellum red; metathorax black with a sharp rim, and a few large rugae more or less radiating; pleura black and rugose; abdominal dorsal segments black, shining, many large punctures, black hair apically, a light dusting of white hair; ventral segments black, shining, a few large punctures, light fringes of white hair.

Legs black, knees and a red line on anterior pair red; tarsi black, apical segment reddish; claws red; hind calcar amber; tegulae black, polished, punctate basally; wings subhyaline; nervures strong, blackish-brown, first recurrent meeting second intercubitus; second cubital cell contracted at top, higher than wide; pterostigma large, dark-brown; hamuli ten, strong.

Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.

Type in the collection of the author

Allies: Approaches *P callomelittinus* Ckll., which has much yellow on legs, polished red mesothorax, and red pleura.

Halictus leichardti Ckll.

Syns. *H. paracolletinus* Ckll., *H. scutellatus* Fr.

A series of large males and females, typical in all characters.
 Locality: Jamberoo, N.S.W. 10th January, 1949-50. Norman W. Rodd.
 Described from Mackay, Kuranda; Dunk Island, Queensland.
 One typical female.
 Locality: Woy Woy, N.S.W. January, 1933. J. Willey.
 One typical female
 Patonga, N.S.W. 26th January, 1947. Norman W. Rodd.
 Taken on flowers of *Leptospermum flavescens* var. *grandiflorum*.

A DISPUTED SPECIES OF RARE BEE.

A series of females, and one male (allotype), definitely establishes an old species and a new record for the State.

When Cockerell, 1931, published his key to Australian species in the genus *Nomia*, he doubted the validity of Friese's species *Nomia flavo-punctata*, described from Mackay, Queensland, leg. Gilbert Turner. Taken on flowers of *Xanthorrhoea* sp. Cockerell concluded: "It is said to be known by the anterior corners of the thorax and the tubercles being thickly covered with yellow tomentum. This seems to me to be a *Paracolletes* of the type of *P. irroratus* Smith." The author has a series of both bees, and there is a superficial likeness, but that is all. The glossa of Friese's bee is long and acute; that of Smith's bee short and emarginate, and the structure of the metathorax is very different; there are, in fact, all the characters that separate HALICTIDAE from COLLETIDAE. It follows, then, that Friese's species is a perfectly valid one, but it is not *Nomia* sensu stricto. The radial cell is acutely pointed on the costal margin (obtuse in *Nomia*); the second cubital cell is often small and quadrate in both genera; the third cubital cell is short (long in *Nomia*); basal nervure often arched in both genera; there is a distinctive sculpture, rugose, on the metathorax.

Unfortunately, the author has only three females and one male from New South Wales, and they are larger than the type (7 mm.), but he refers them to *Halictus flavopunctatus* (Friese); when the two males are known they may be separated from the Queensland bee.

However, Friese's description is inadequate, and not readily available to students, and the species is now redescribed.

Halictus flavopunctatus (Perez et Friese) stat. nov.

Female—Length, 10 mm. approx. Black, with maculae of golden hair. Head circular from the front, bright, a few pale hairs; face with a few black hairs laterad of the clypeus; frons rugoso-punctate; clypeus prominently convex, a median sulcus, coarse scattered punctures, very shining; supraclypeal area convex, shining, rising to a fine carina that reaches the median ocellus; vertex with some smoky hair; compound eyes reniform, black; genae finely rugose, with blackish hair; labrum black, with a large median tubercle; mandibulae black; antennae black, flagellum dull ferruginous beneath.

Prothorax laterally, the anterior corners of the mesothorax, the tubercles, and a large patch posteriorly, all united to form a conspicuous macula of golden hair, felted, mesothorax with well-separated coarse punctures, the interval shining, a few blackish hairs; scutellum and post-scutellum similar, but the latter covered with a felting of moss-like golden hair; metathorax large, with a sharp rim, and a few longitudinal coarse rugae superimposed on a fine tessellation; abdominal dorsal segments finely and closely punctate, a few blackish hairs; caudal fimbria of smoky hair (in certain lights the abdomen has an obscure metallic-green sheen); ventral segments with a fringe of stiff black hair; anteriorly the segments are polished.

Legs black, with black hair, smoky on the trochanters and femora; tarsi black; claws reddish-black; hind calcar black, finely serrated; tegulae black, with a large polished area; wings dusky, nervures blackish, first recurrent meeting the second intercubitus; second cubital cell contracted a trifle at the top; the third cubital cell short (it is as long as the first in *Nomia* sensu stricto); pterostigma amber, suffused with blackish; hamuli ten, strong.

Allotype: Male, length, 10 mm. approx. Similar in colour.

The slender aspect is typically halictine. Head capsule circular when viewed from the front; the compound eyes converge sharply below; clypeus polished, highly convex, with the yellow subtriangular mark pointed apically; segments of the flagellum are very long, and clear ferruginous beneath.

Although neither the mouth-parts, nor the appendage of the labrum, or the genitalia could be critically examined, yet there is no doubt that these bees are *Halictus*, and not *Nomia*.

The scutellum is highly bituberculate; postscutellum with a dense tuft of golden hair; the large enclosed area of the metathorax has twelve or so coarse longitudinal

rugae superimposed on a delicate sculpture; the anterior "corners" of the mesothorax have the distinctive maculae of golden hair; pleura finely and transversely striate.

The elongate abdomen is only 2.5 mm. in width, and the long slender legs are not at all modified, but there is much blackish hair.

Locality: Jamberoo, N.S.W. January, 1950. Norman W. Rodd.

Specimens in the collection of the author

Allies: Not close to any described species The superficial aspect is that of *Paracolletes irroratus* Smith.

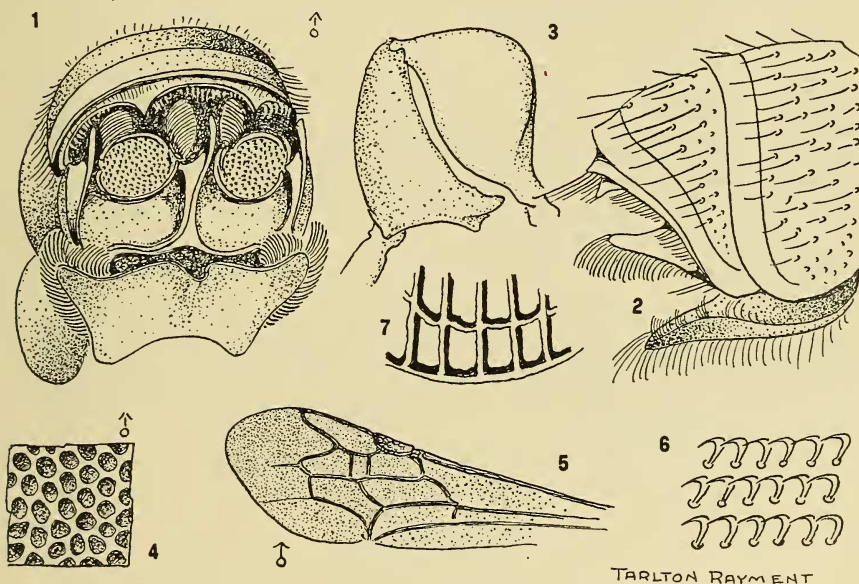
Taken on flowers of *Parsonia straminea*.

Sub-family NOMIINAE.

Nomia miranda, sp. nov.

Type, Male—Length, 11 mm. approx. Black, dark green abdomen.

Head black, closely punctured; face with a dense mat of long golden hair; frons closely punctured; clypeus convex, with a median depression, anteriorly pale-amber;



TARLTON RAYMENT

Fig. 3: Details of *Nomia miranda*, sp. nov.

1. Oblique view of apical ventral segments of male, showing the remarkable structure of the sterna.
2. Lateral view of apical segment of the abdomen.
3. Trigonal hind femur and tibia.
4. The interval of the coarse punctation of the mesothorax is smooth and shining.
5. Anterior wing; note the large third cubital and the quadrate second cubital cell.
6. The sense-organs of the sternum are difficult to observe, but they appear to be arranged in this order.
7. Position of the coarse rugae of the metathorax.

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supraclypeal area rising to a fine carina reaching the median ocellus; vertex closely punctured, with some golden hair; compound eyes reniform; genae with shallow punctures, and long pale hair; labrum reddish-amber; mandibulae largely amber, blackish apically; antennae long, flagellum black, scape amber, short.

Prothorax black, laterally with much golden hair; tubercles black, with a fringe of white hair; mesothorax black, closely punctured, with long loose straw-coloured hair; laterally a maculae of whitish hair in the scutellar suture; scutellum conspicuously bi-tuberculate, with erect long black hair; postscutellum with denser whitish hair; metathorax with the area enclosed by a sharp rim, a number of coarse longitudinal rugae connected by a median transverse ruga, tufts of long white hair laterally; abdominal dorsal segments metallic greenish-blue; the posterior margins aeneas, with fasciae of golden hair, all closely punctured; only six segments visible, the seventh concealed by the structure illustrated in the text figure, dorsally there are many long coarse black setae; ventral segments polished green, the fourth excessively large, and bent down in a unique manner and developed laterally with two long white fringes.

The fifth sternum is polished with a large median black tooth directed apicad from a median carina, posteriorly are two large circular depressions densely covered with golden hooked setae forming some kind of sensory organ; laterad is a large tooth; the other apical segments cannot be examined since they are masked by the structure, but long white hairs project between the segments. It is impossible to describe adequately these unique sterna of the abdomen.

Legs black, with white hair, and when the triangular hind tibia is folded against the triangular femur, the outline is quadrangular; both are incrassate; tarsi black, white hair; claws bifid, reddish-amber; hind calcar small, amber; tegulae amber, with a large black area; wings deeply infuscated; nervures brownish-black, the first recurrent meeting the middle of the small second cubital cell, which is quadrangular; pterostigma brown, large; hamuli fifteen, well developed.

Locality: Jamberoo, N.S.W. 10th January, 1950. Norman W. Rodd.

Type in the collection of the author

Allies: Plainly near *N. australica*, but darker, and differs by the structure of the abdomen.

The sense organs of the sternum appear to be homologous with those on a male *Megachile remeata* Ckll. illustrated by the author in Victorian "Naturalist," January, 1950, and probably has some function in the congress of the sexes. The author again regrets that he has only the type insect, and the structure could not be critically investigated. The species will be confused with *N. australica* unless the sterna be examined critically.

Taken on flowers of *Leptospermum flavescens* var. *grandiflorum*.

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